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ABSTRACT

A pictograph and icon-driven training program has been specifically designed for educators who are responsible for teaching the developmentally disabled regarding the safe use of hazardous chemicals. In alignment with the Americans with Disabilities Act, it offers "reasonable accommodation" by those who educate and train this special population in schools within a vocational training center, sheltered workshop, or workers enclave. The purpose of the program is to promote worker understanding of safety issues involving the Occupational Safety and Health Administration "Right-to-Know" specifically for those individuals who have difficulty reading printed text. The presentation of the material includes specifics on understanding labeling systems, the Material Safety Data Sheets (MSDS) and other pertinent topics such as hazard detection, care of the victim of an exposure, and accident simulation drills. The training includes the use of computer software designed to promote understanding of the MSDS with the aid of picture icons. This PC software program is designed to supplement the MSDS with chemical identification, key label words, and picture icons with the following: National Fire Protection Association Code, fire extinguishing media, routes of entry, health hazard icons, personal protective equipment, pictographs, and target organ graphics. An assessment package is provided. (YLB)

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Reasonable Accommodation in Training Safety
A Paper Presentation at the Louisiana Educational Research Association Annual Meeting
February 20-21, 2003

by

Jeff Sandoz, Ph.D.
Assistant Professor
College of Education
University of Louisiana at Lafayette

Abstract

The Occupational Safety and Health Administration (OSHA) hazard communication standard ensures that all individuals have a 'right-to-know' what the hazards are associated with the use of manufactured chemical products and how to protect oneself against such hazards. However, there is no comprehensive program currently in place which is designed to train the specific needs of a developmentally disabled population of workers. Similarly, there is no instructional program in place for the care-givers and staff who serve the workers with mental retardation. In alignment with the Americans with Disabilities Act, this paper will offer "reasonable accommodation" by those who educate and train this special population in schools within a vocational training center, with a sheltered workshop, or workers enclave. This pictograph and icon-driven training program is specifically designed for educators who are responsible for teaching the developmentally disabled regarding the safe use of hazardous chemicals. Icons include graphic representations of 1) Routes of Entry, 2) Hazard Icons, 3) Protective Equipment Pictographs, and 4) The National Fire Protection Association (NFPA) Code.

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by
Jeff Sandoz, Ph.D.
Assistant Professor
College of Education
University of Louisiana at Lafayette

Introduction

The purpose of the training program is designed to promote worker understanding of safety issues involving the Occupational Safety and Health Administration (OSHA) "Right-To-Know" specifically for those individuals who have difficulty reading printed text. Currently there is no comprehensive program available which attempts to provide "reasonable accommodation" in the training of the functionally illiterate, or persons with limited intellectual function due to mental retardation or those with reading disabilities, or the lack of adequate training in school. With the use of pictographs, icons and simple drawings, the manner of presentation combines the simplicity of visual pictures with a thorough verbal explanation of the following:

a) What are the types of hazards associated with the use of a chemical?
b) How can the chemical enter the body?
c) What are the symptoms of exposure?
d) What preventative measures and protective equipment can be used?

The Training Program

The presentation of material includes specifics on understanding labeling systems, the Material Safety Data Sheets (MSDS) and other pertinent topics such as hazard detection, care of the victim of an exposure, and accident simulation drills.

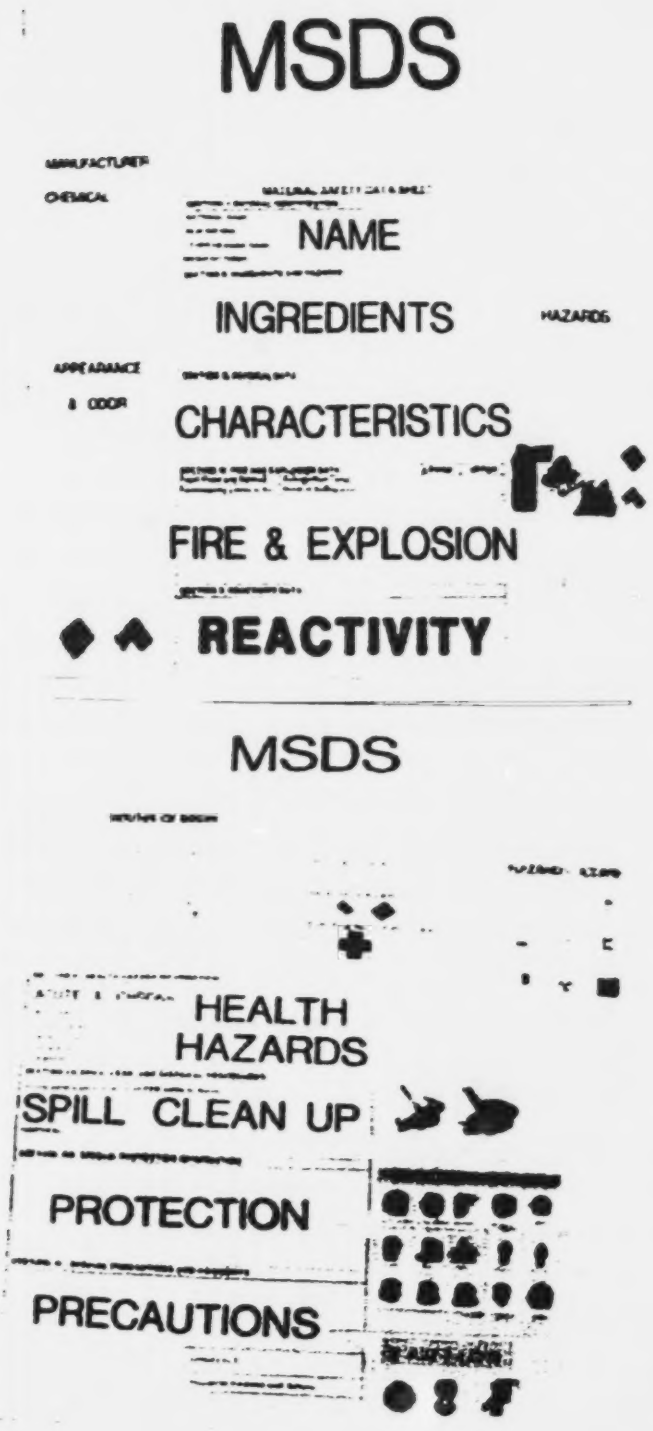
The Software Program

The training in this program includes the use of computer software that is designed to promote the understanding of the Material Safety Data Sheets (MSDS) with the aid of picture icons. Although there are PC (Personal Computer) software products currently available on the market which print labels for containers, this PC software program is designed to supplement the MSDS with chemical identification, key label words, and picture icons with the following:

- NFPA Code
- Fire Extinguishing Media
- Routes of Entry
- Health Hazard Icons
- Personal Protective Equipment Pictographs and
- Target Organ graphics

Figure 1 includes details of the MSDS with an insertion of picture icons which are known as pictographs.

Figure 1. MSDS with pictographs.



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The Labeling Program

The resulting labels could be attached to the MSDS for the purpose of providing a graphic short hand for quick reference. The information presented in this form has several advantages in that the graphics are simple and readily understandable. In addition, the graphic short hand is designed to enhance response time during emergency situations. The overall effect will be to bridge the gap between MSDS and the labels which can employ the same graphic images. This program can be expanded by adding the current Department of Transportation (D.O.T.) icons and the National Fire Protection Association (NFPA), Hazardous Material Information System (HMIS), Hazardous Material Identification Guide (HMIG) format. See Figure 2 for details.

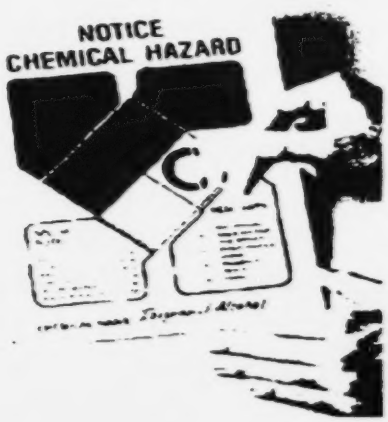
Figure 2.

Department of Transportation icons

National Fire Protection Association

Hazardous Material Information System

Hazardous Material Identification Guide



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Assessment of Learning

The purpose of the testing device program is designed to assess the amount of learning resulting from the training program. The purpose is to provide a measure of evaluating the worker's level of understanding of the sight recognition of the safety icons. This assessment package is developed specifically for those individuals who have difficulty reading the printed word and is designed to be used in conjunction with the two previously proposed aspects of training.

The objective of the assessment device is to provide an additional supportive mechanism which offers "reasonable accommodation" in the training of the functionally illiterate due to reading disabilities, a limited level of intellectual functioning, the lack of adequate training in school and those who use English as a second language. The safety icons are presented in a forced choice format to the trainees. Responses to the examiner's questions involve the trainee's touching one of the four icon choices.

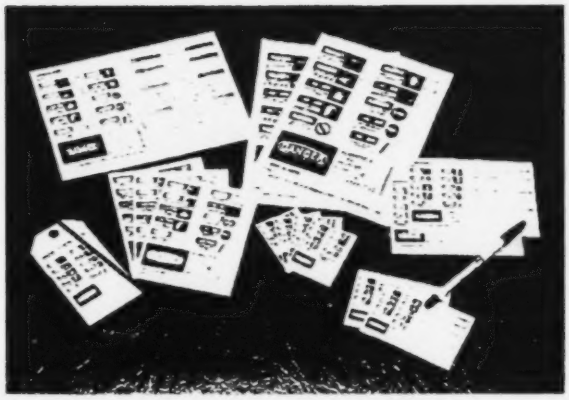
The assessment device is designed to be used immediately following a training session in which a specific icon category is presented. Each section of the assessment device consists of icons of the following categories:

- Protective Equipment
- Target Organs
- Emergency Response Equipment
- Hazards
- Routes of Entry
- NFPA Hazard Labeling System

Additional Graphic Labels

With the training other graphic images/icons could be added which may include various combinations of DOT labels and the NFPA, HMIG or HMIS format. See Figure 3 for details.

Figure 3.



The manner of presentation of the assessment device could take the following forms:

- a printed format on a ring binder, or bound book
- a computer software package with accessories including touch screen and voice synthesizer capabilities [ECHO-II Speech Processing Systems]

This computer software program will be the first of its kind to evaluate the degree of icon/word association learning that is mastered by the trainee and will provide record keeping of the incorrect responses. The record keeping will offer feedback to the trainer on which areas the

trainee has missed. The frequency of the incorrect responses act as an indicator as to which sections may need to be retrained. In this manner, trainer one-on-one time with the trainees is reduced, thus saving the consumer expensive additional training costs.

Additional tutorial training could be offered with the computer software program which may include touching the icon on the screen and a human synthesized voice responds with a verbalization identifying what the icon is. In addition to the talking icon touch window tutorial, some lessons can be individually programmed by the trainer to include specific icons which are used at the work site.

The purpose of accessory materials are designed to facilitate and enhance greater recognition (learning) of the safety icons as based on the results of the research study which was presented at the American Association on Mental Retardation (AAMR) convention in Washington (Sandoz, 1993).

The objective of the additional training material is to provide visual and graphic figures that promote the association of icons and other pictorial images with specific meanings. For example, this process involves the use of a triptych format. Specifically, the method utilizes the simultaneous presentation of the safety icon of a protective equipment device, a picture of the actual device and a picture of a person modeling the equipment. A similar variation could be offered for hazard icons which may include the presentation of the hazard icon, a drawing indicating an action scene involving the hazard and the resulting consequences of the hazard with and without protective measures. The method of presentation could be in the form of a slide card, or a spin disk, or could vary depending on the needs of the workers. The appearance could be in the form of transparencies, a video presentation, or a handbook used to accompany the lecture. Other devices could include flash cards, or a pocket icon dictionary that offers an explanation in a graphic or illustrated format.

Another method includes a video game format which involves a knight armored with protective equipment (Figure 4) fighting the 9 headed hazard hydra (Figure 5). Procedures of the video game comprise of an apprenticeship including correct identification of the icons used on the MSDS label (a lance as seen if Figure 6 along with a housekeeping horse) to fight the hazard. If the wrong response is selected then the hydra grows another head and/or the knight becomes weakened as a symptom of the exposure. Emergency response equipment can be used to help the knight to recover, otherwise the game is over. A detailed printout of incorrect responses may be available in order to facilitate learning and designating in what areas the trainee can improve. This video game format provides an enjoyable way to reinforce learning through a decision based process and to assess the weak areas. This video game and the aforementioned program can be expanded by adding DOT icons and the NFPA/HMIG/HMIS format.

Conclusion

The various aspects of this program are designed to address the special needs of the growing number of workers in the U.S. who have difficulty understanding printed messages. The concepts involved in this program differ significantly from other safety training programs and methods currently on the market since both attempt to make "reasonable accommodation" to meet the worker's current level of functioning. There are other training programs currently on the market which presume literacy and attempt to teach at that level. To presume literacy fails to consider the specific needs of those being trained thus compounding the risks and dangers, fear of litigation. This program is versatile in that it can be utilized in conjunction with other products on the market for training a developmentally disabled population.

Figure 4.

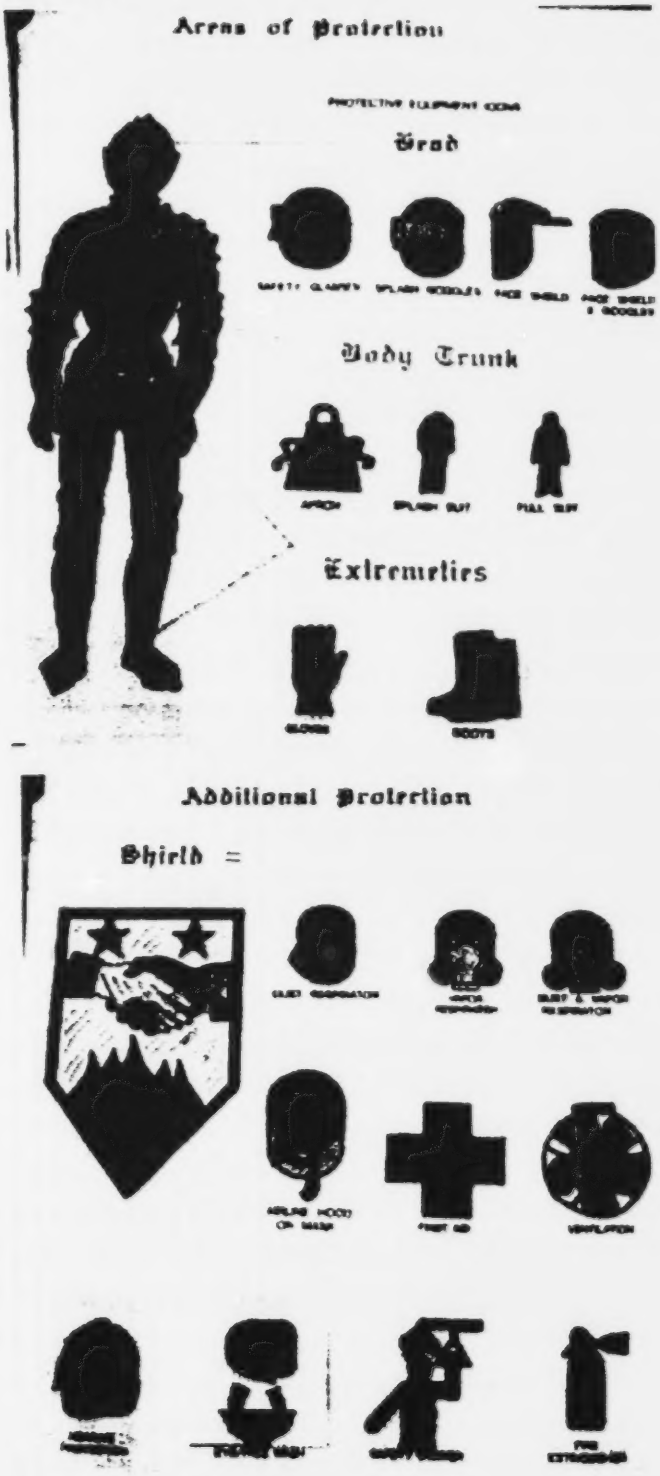


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Figure 5.

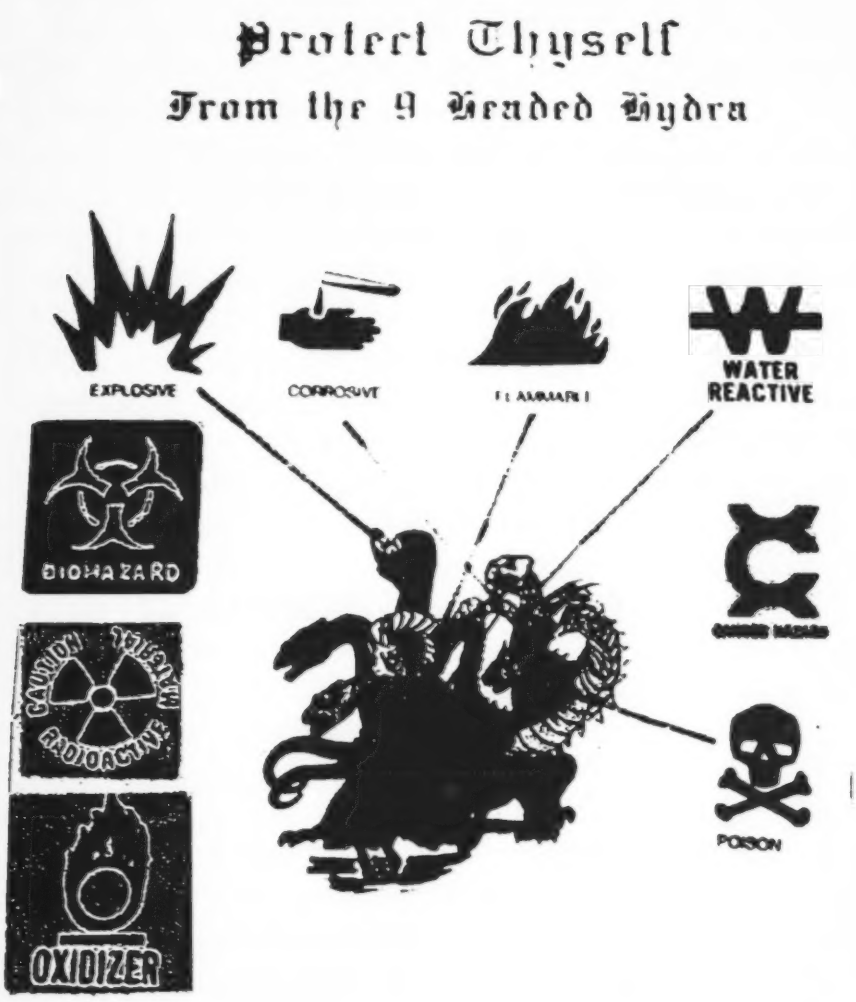

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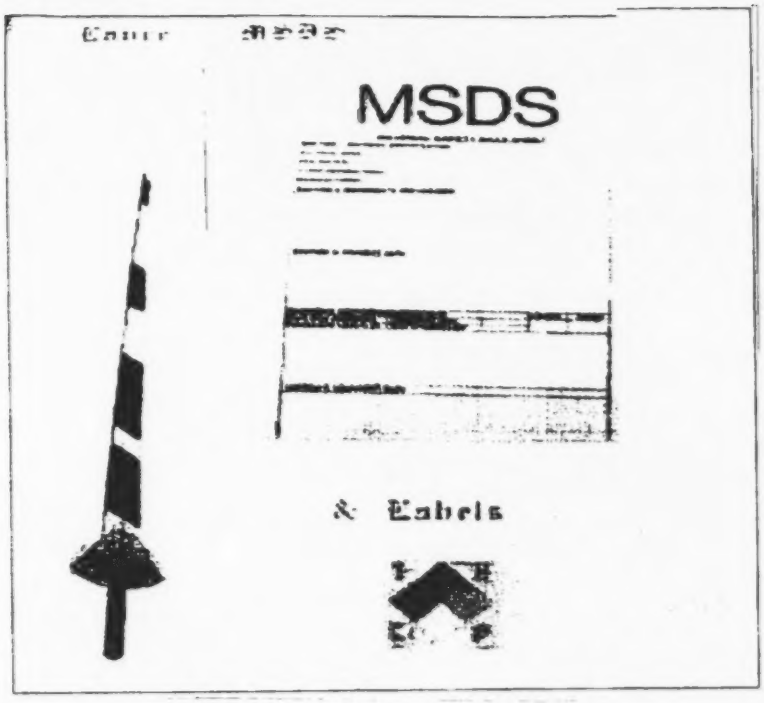
Figure 6.



Policies & Procedures

The Horse

- = Housekeeping ‹NEAT›
- = Organized ‹STORAGE›
- = Rules ‹SAFETY›
- = Strategies for emergencies ‹PLANS›
- = Environmental controls ‹WORK FLOW›

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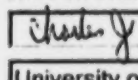
Signature:	
Organization:	University of Louisana at Lafayette
Position:	Assistant Professor, College of Education
Address:	P.O. Box 43091 Lafayette, LA
Zip Code:	70504-3091
Telephone No:	337-482-1010

Fax:	
E-mail:	sandoz@louisiana.edu
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